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ABSTRACT

This study found that microteaching experience significantly improved subsequent performance of student teachers on five of six specific factors derived from the Teacher Performance Evaluation Scale (TPES). Subjects in the study were 37 secondary education majors who were randomly assigned to experimental or control groups. Students in the experimental group participated in at least three microteaching sessions using peers as pupils. The microteaching sessions were videotaped and then viewed and critiqued by the student, his supervisor, and the peer "pupils." Both experimental and control subjects were then evaluated three times--at the beginning, middle, and end of 8 weeks of student teaching. Data obtained from the TPES were factor analyzed resulting in six subscales: 1) personality traits, 2) warmth of teacher behavior, 3) general classroom atmosphers, 4) lesson usefulness, 5) teacher interest in pupils, and 6) teacher interest in student achievement. Results from analysis of variance showed that subjects with microteaching experience received significantly higher ratings on the first five factors. Several interactions with the time variable were also noted with the general trend being toward greater difference between groups at the end of student teaching. (RT)

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The Effect of Televised Simulated Instruction on Subsequent Teaching

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Simulation can be defined as an instructional problem solving activity which closely resembles a situation in life. As early as the beginning of the twentieth century, John Dewey advocated the use of simulation activity as a means of stimulating thought and increasing interest in specific situations. Dewey also viewed simulation as a means of controlling such variables as feedback, task complexity, negative experiences and cost (Broadbent, 1967). Although there is no specific way to employ simulation in learning, it generally involves three basic steps: (1) action on the part of the learner, (2) feedback on success or failure and (3) a concise summary of response and appropriate solution to the problem (Edinger, 1968). Psychology and education have been late-comers in adapting and using the principles of simulation for the training of professional people. However, with the invention of video tape recording devices, simulation has acquired a new popularity in these disciplines. Video tape recording uses a closed circuit television camera and television monitor to record activity of a person or group of persons involved in a learning situation. The equipment is portable enough to be used almost anywhere and therefore therapists, counselors and teachers are able to examine their own behavior during training.

It is assumed that behavior change is facilitated if the behavior

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is recognized. Tuckman and Oliver (1968) conducted a study that demonstrated the need of the patient or trainee to view his behavior. Subjects were thought to react against a supervisor's criticism because of a supposed hostility, but student evaluations and video feedback were proported to avoid this difficulty and worked equally well in producing appropriate behavior.

On the other hand, Borg (1969) concluded that performance will improve if practice is given without video feedback or supervisor evaluation. However, Borg's study failed to control for previous training and supervisor interaction before and during the treatment. Lockhart (1968) showed that microteaching, which is simulated activity directed toward preparation of teachers, can be substituted without serious disadvantage for a more lengthy time in actual student teaching. Kallenbach and Gall (1969) conducted a study to determine if microteaching could replace student teaching as a training method. They concluded that no difference exists in ability to perform after either experience, but that microteaching involves less time. The dependent measure was the ability to teach in the classroom immediately after training and one year later.

The research with simulation activity, especially video tapes, has been more action-oriented than theoretical. Unfortunately, most of the literature reports good feelings rather than concrete conclusions. One exception was Bjerstedt (1968). Bjerstedt evaluated teachers' ability to make decisions in situations involving interactions. She gave one group of subjects simulated experience and other groups received written descriptions of the situations. Video tapes showing an interaction would be stopped at crucial moments and subjects would be

asked for a decision. The group viewing the tapes was able to make more correct decisions in less time than the group that only read a description of the situations.

Simulation using video tapes can be used to present appropriate or inappropriate models for any specific situation. These models can be used as evaluation tools by requiring that subjects identify or correctly classify model behavior. Video recorders were used at Stanford to predict classroom success for new teachers. Gibson (1968) required his pre-service teachers to be recorded teaching a lesson. These tapes were then evaluated by trained graduate assistants. Each student was evaluated later during the first teaching assignment and the two evaluations were correlated to show that students receiving poor ratings were rated inferior as teachers.

Foster (1967) states that some of the advantages of microteaching are its potential for simplifying the teaching act, permitting adequate feedback, reducing training time, and providing a realistic appraisal of performance. Nevertheless, Foster, Lundy and Hale (1967) conclude the potentiality is good but the results, as indicated by research, are not adequate. The variables of models, supervisors, reinforcement, feedback and focus of problems are not being considered in the research (Politzer, 1969). It appears that microteaching as a simulation experience in teaching has not been tested with adequate research. In addition, it has not been determined exactly what aspect of teaching is influenced or if a permanent change occurs.

Lundy and Hale reported that microteaching prepares a trainee to teach because the conditions of the two experiences are closely associated.

They conclude that since anxiety is present in both situations, the use of microteaching will decrease anxious responding and this makes student teaching a more meaningful experience. Travers (1952) alluded to this same idea. He reported that because anxiety hinders learning it handicaps student teachers by causing them to be discouraged, disorganized, thus leading to poorer performance. He concluded that student teaching is the type of situation in which anxiety develops and it would be helpful, especially at first, if the situation could be made more predictable to reduce the anxiety.

It was hypothesized that since microteaching is a very similar experience to actual teaching, it should improve subsequent teaching, especially at the beginning of the experience, because it reduces anxiety and increases the predictability of the subsequent teaching. The student should be more confident and less anxious about his ability to teach after microteaching. Increased self confidence should logically be visible in such specific behaviors as poise, speech, and other observable indicators of nervousness. Since those students having simulation experience would theoretically require less time for adjustment to subsequent teaching, their experience should be more profitable, and they should increase in proficiency faster than those not having had microteaching.

While previous investigations about the effects of microteaching have only rarely used control groups, none have examined separably the specific areas of the teacher's behavior. In addition, previous experiments have not made repeated observations to determine the longitudinal

effect of microteaching. This experiment was designed to help meet the need for more controlled experiments on the effects of microteaching and to investigate different areas of teacher behavior over more than one time period.

Method

Subjects

Subjects were enrolled in Brigham Young University's Experimental Teacher Education Program, called I-STEP. All subjects were completing their course requirements during the semester. A program requirement, which influenced the organization of this experiment, grouped the subjects into 26 teams of two or three members with two subjects unassigned. This was done on the basis of subject matter expertise and student teaching assignment. Only those teams which would be teaching cognitively-oriented subjects, such as social science, math, English, etc., were used, e.g., students in physical education, music or languages were excluded. This procedure eliminated all but thirteen teams and the two individuals.

By use of a table of random numbers, six teams and one individual were assigned to the experimental group for a total of 19 subjects. Seven teams and one individual were assigned to the control group for a total of 19 subjects. The only restriction placed on the assignment was that an equal number of subjects in each group would be teaching similar subject matter.

Five subjects were dropped from the study for one of the following reasons: (1) withdrawal from school; (2) lack of available data due

to sickness; (3) bias by the evaluator. Bias by two raters was assumed because they had been involved in the instruction of some subjects. Two males and three females were dropped from the control group and data was generated from the mean scores of the remaining subjects. One group had five persons teaching on the junior high level as compared to six persons in the other group. All others taught senior high school pupils. GPA was 3.11 and 3.09 in the two groups. The experimental group had 6 females and 11 males and the control group had 4 females and 8 males.

Apparatus and Materials

The equipment consisted of a sound-deadened studio equipped with a desk, student chairs, blackboard and recording material. A video camera situated at the back of the room was positioned to view both the subjects and the pupils during the simulation. A video recorder and television playback unit was located at one side of the studio.

1. Teaching performance was measured with the Teacher Performance Evaluation Scale (TPES) (Sinha, 1962). The scale is used to measure specific behaviors of persons engaged in teaching, and it is detailed enough to evaluate specific actions. The original scale had each item rated by a panel of professional educators from various parts of the United States. The scale consists of forty-two areas, each measuring a specific behavior or attitude necessary for a teacher to be "successful." Each item is rated on an eight-point scale ranging from zero to seven. The higher the rating obtained, the more appropriate the behavior is considered to be. Because of concern by the experimenters about the

homogeneity of the items within each of the areas, the items were factor analyzed and six factors having item correlations greater than .60 appeared: (1) personality traits, (2) warmth of teacher behavior, (3) general classroom atmosphere, (4) lesson usefulness, (5) teacher interest in pupils, (6) teacher interest in student achievement. Groups 1, 2, and 3 were the same as the original scale.

Design and Procedure

Within the limits already specified, the subjects were randomly assigned to a control group or to an experimental group. The experimental group consisted of those subjects who received the simulation activity. The control group subjects received all phases of the teacher training program, excluding only the simulation activity. The training program was individualized to the extent that each subject had certain assignments to accomplish but each subject worked under his own schedule. Microteaching was merely another assignment for the experimental group and was completed when the subjects desired.

During their participation in the I-STEP program, students participated in at least three of the simulation activities called microteaching. The microteaching model used at Brigham Young University involves four steps: (1) the subject studies a specific teaching skill; (2) he applies the skill to a seven-minute lesson taught to four or five peers; (3) the lesson is video taped and then viewed by the student; (4) the lesson is evaluated and critiqued. If necessary, the student reteaches the lesson. Peers used as "pupils" in microteaching are also students of I-STEP. They are used because they participate freely and are willing to evaluate the lesson as objectively as possible.

The lesson was video taped from a camera placed on the rear of the room. The camera was positioned to record the subject and at least one-half of the class of pupils at all times. Immediately after the lesson was completed, the subject was allowed to view himself via the television monitor situated at one side of the room. When deemed appropriate by the supervisor, the viewing was stopped and both supervisor and peers orally evaluated the lesson. After the entire lesson had been viewed, the peers and supervisor submitted a written evaluation to the subject. The written evaluations expressed praise and suggestions for improvement. The subject collected all evaluations and submitted a summary of his lesson to the supervisor and/or his plans for reteaching the lesson.

Following completion of the microteaching, the subjects spent three hours a day, for eight weeks, in their assigned classroom in the public schools. Three times during this eight-week period, the first two weeks, the third-fourth weeks and the seventh-eighth weeks, the subjects' supervisors observed a lesson and completed the TPES on that performance. Individual staff members who were unaware in the microteaching phase of the experiment were the raters. The raters participating in the evaluation phase were experienced in evaluating student teachers and the same raters evaluated students in both treatment conditions.

Results

The experimental design used in this study required a three-way repeated measure analysis of variance. The first factor (A) was the

two groups, (B) was subjects and (C) was the three observations or time. The data obtained with the TPES were scored into the six components or subscales resulting from the factor analysis.

There was at least one significant F-ratio for each of the factors and accordingly each factor will now be discussed. The means for each group and evaluation period can be observed in the corresponding figure. Only the interaction F-ratio will be presented in the text for those factors having both significant main and interaction effects.

On Factor 1, Personality Traits, there was a significant interaction between groups and the time variable, $F(2,48)=4.11$ ($p < .05$). The mean scores for each group is presented in Figure 1. A Tukey (a) comparison was used for single comparisons and the asteric in the figure indicates that there was a significant difference between the control and experimental groups for that time period. In Figure 1 the microteaching group received a superior rating at each observation.

Insert Figure 1 here

A measure of teacher warmth and consideration for students was Factor 2. Although both groups improved over time ($p < .001$) the experimental group was rated significantly better ($p < .001$). There was a significant interaction effect $F(2,48)=3.97$ ($p < .05$). The means for this measure is presented in Figure 2. The microteaching group improved more rapidly.

Insert Figure 2 here

The third factor, that of General Classroom Atmosphere, also had a significant difference between groups ($p < .05$) and across time ($p < .01$). However, the interaction effect was again significant $F(2,48)=3.75$, ($p < .05$). The experimental group improved more for the second and third observations, as illustrated on Figure 3.

Insert Figure 3 here

Data collected on the subjects' ability to present meaningful lessons (Factor 4) shows an improvement over time ($p < .05$) and a significant group effect $F(1,48)=31.17$, ($p < .001$). The interaction was not significant. Means plotted in Figure 4 for this measure are interpreted as showing that the experimental group had constant improvement but the control group did not.

Insert Figure 4 here

For teacher interest directed toward students (Factor 5), there was a significant Time X Treatment interaction $F(2,48)=9.70$, ($p < .001$). There was a steady decrease in performance by the control group while the experimental group improved, observable in Figure 5.

Insert Figure 5 here

Mean scores for teacher interest in student achievement are displayed on Figure 6. There was only significant improvement over time

$F(2,48)=13.44$, ($p < .001$) which is consistent with both groups. Although the experimental group received higher ratings than the controls, the difference was not significant.

Insert Figure 6 here

Because the microteaching group received superior ratings on all but one measure, it is concluded that the inclusion of microteaching in this training program of teachers was beneficial. This conclusion is maintained even though the superiority was sometimes not evident until the third observation after approximately six weeks of teaching.

The failure to find the microteaching group superior on the initial rating for the subscales indicates that the effects of microteaching are not temporary but may even increase with a lapse of time. Accordingly, it is suggested that the benefits of microteaching are not due to a temporary reduction of anxiety or some other personal attribute but may reflect that subjects learned a basic problem solving attitude during microteaching which is progressively reflected in teaching performance. Of course, the explanation that microteaching reduces anxiety at the beginning of student teaching allowing the student to profit more from the teaching experience is also consistent with these findings. The group differences on different subscales indicates that the hypothesized problem solving skill learned during microteaching is likely to be task-or lesson-oriented as opposed to pupil-centered. The microteaching subjects initially showed less interest in pupils, but this was reversed in the ratings during the third period. The only

scale where the microteaching group did not excell the control was in interest in student achievement.

While noting that several additional variables, such as feedback or subject's personality, were not included in this experiment, it is felt that these data provide the clearest, most specific description of the effect of televised microteaching on subsequent classroom teaching.

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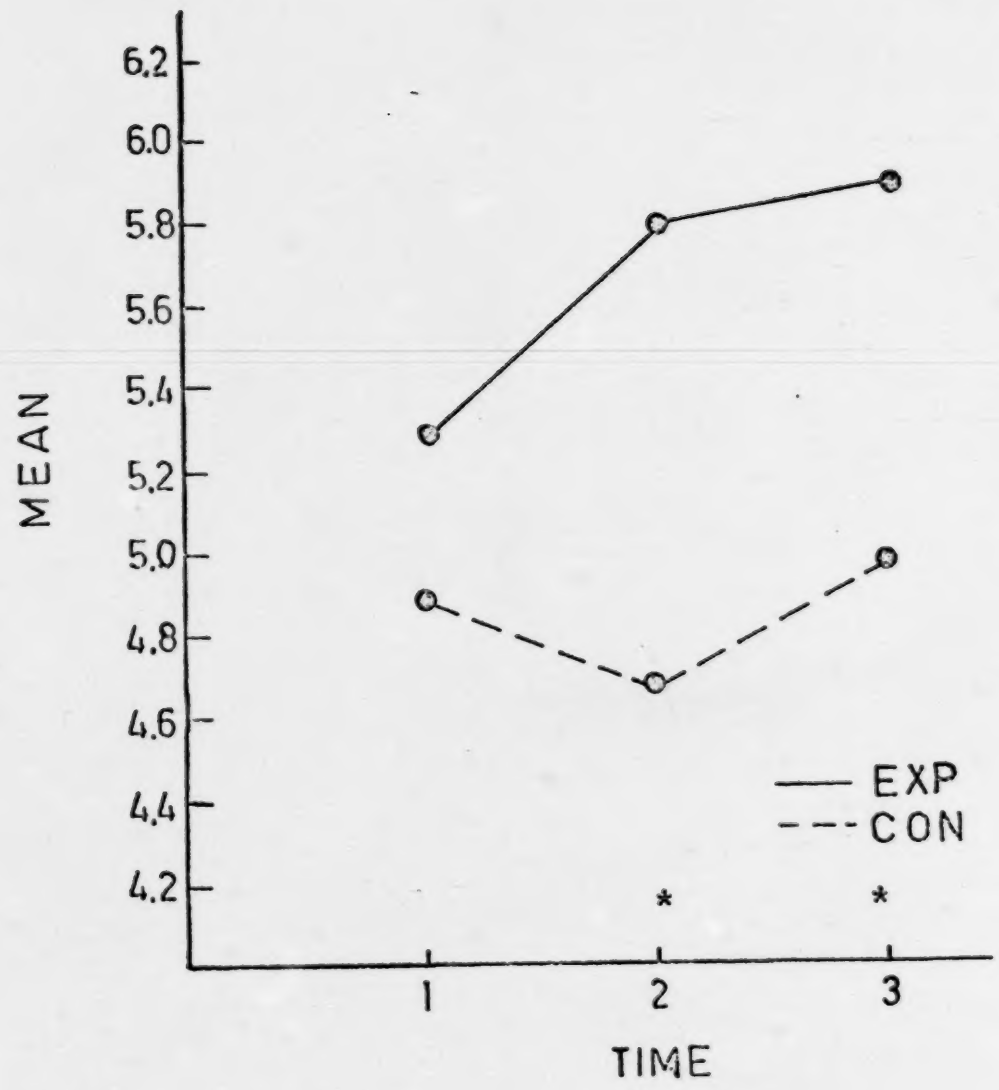


Fig. 1 Mean ratings for Personality Traits. Asterisks indicate significant difference between groups ($p < .05$) using the Tukey (a) test.

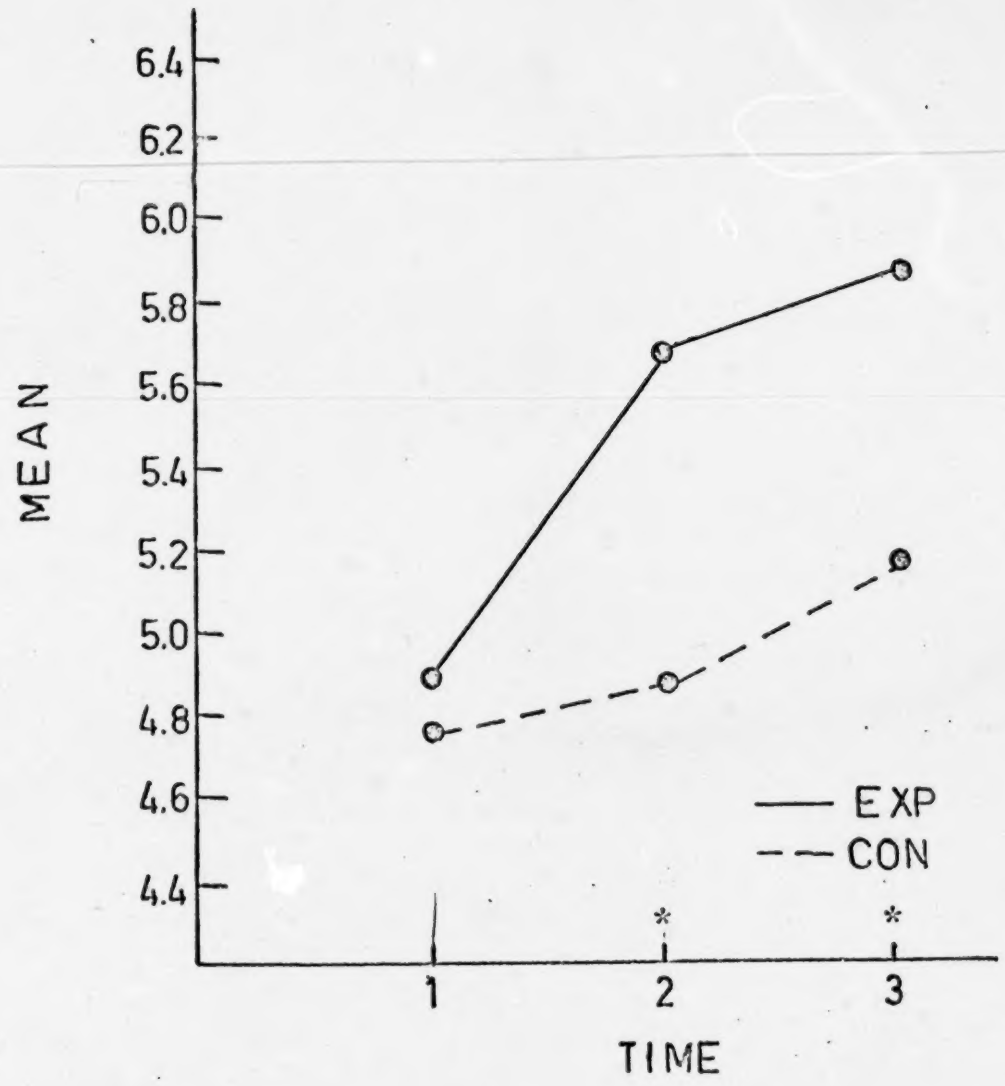


Fig. 2 Mean ratings for Warmth of Teacher Behavior. Asterisks indicate significatn difference between groups ($p < .05$) using the Tukey (a) test.

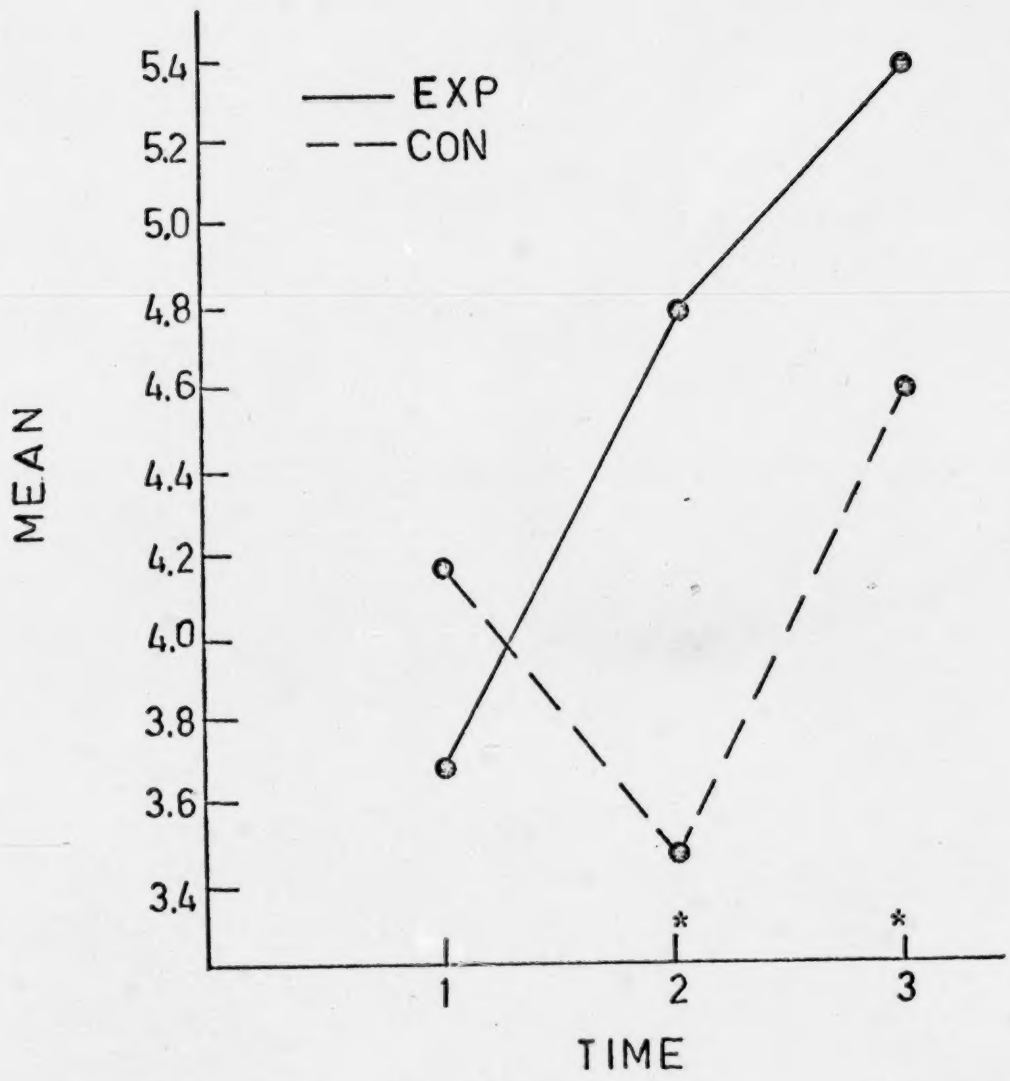


Fig. 3 Mean ratings for General Classroom Atmosphere. Asterisks indicate significant difference between groups ($p < .05$) using the Tukey (a) test.

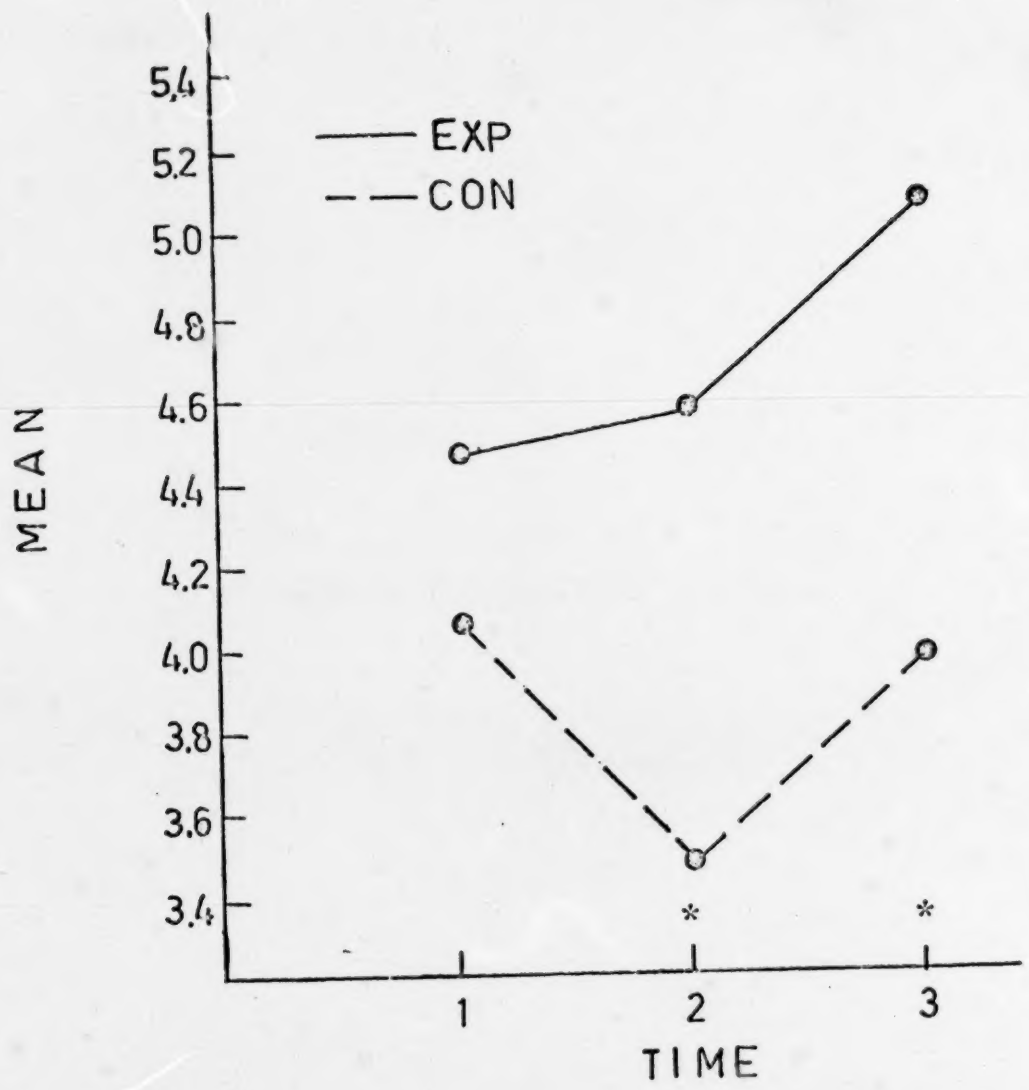


Fig. 4. Mean ratings for Lesson Usefulness. Asterisks indicate significant difference between groups ($p < .05$) using the Tukey (a) test.

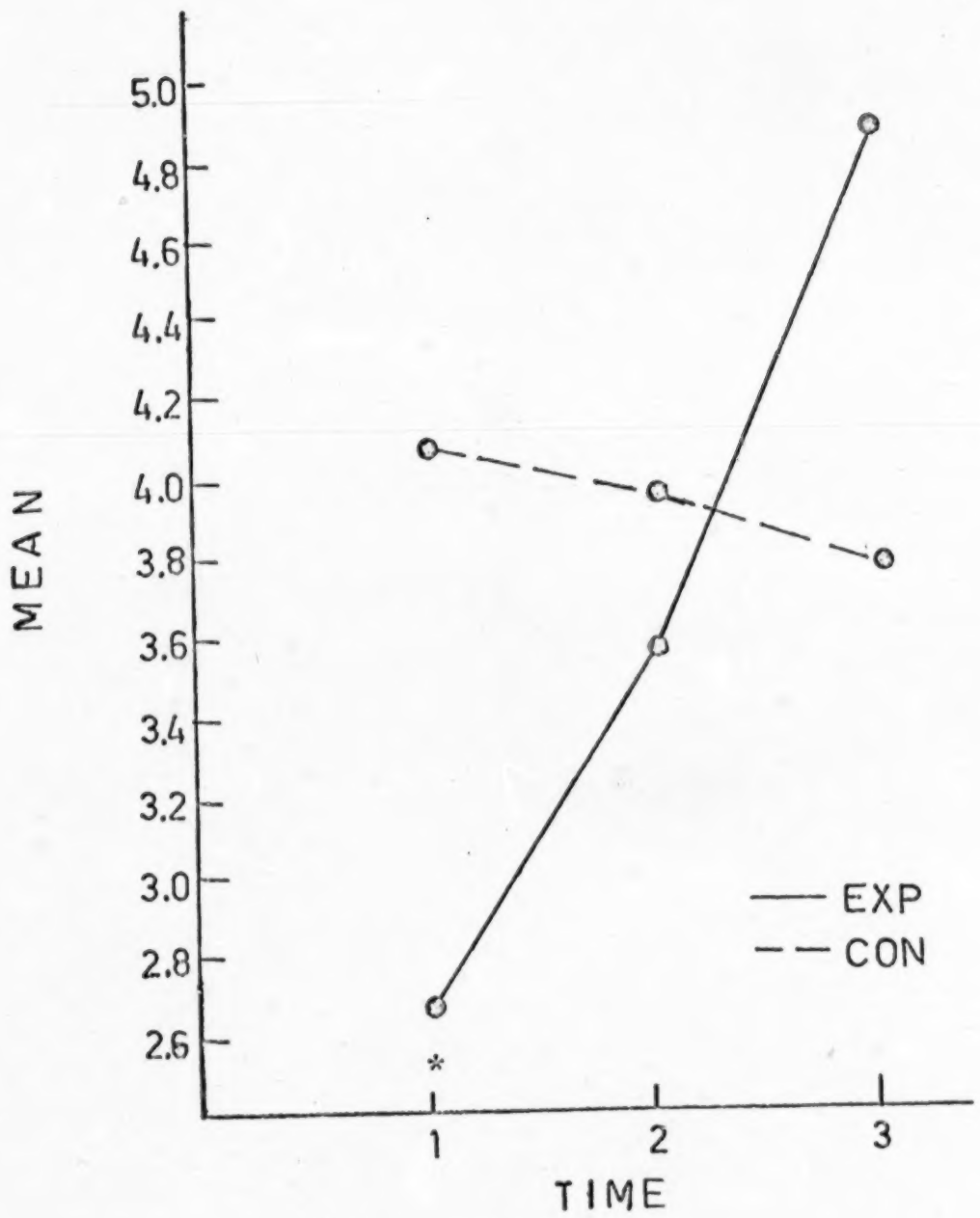
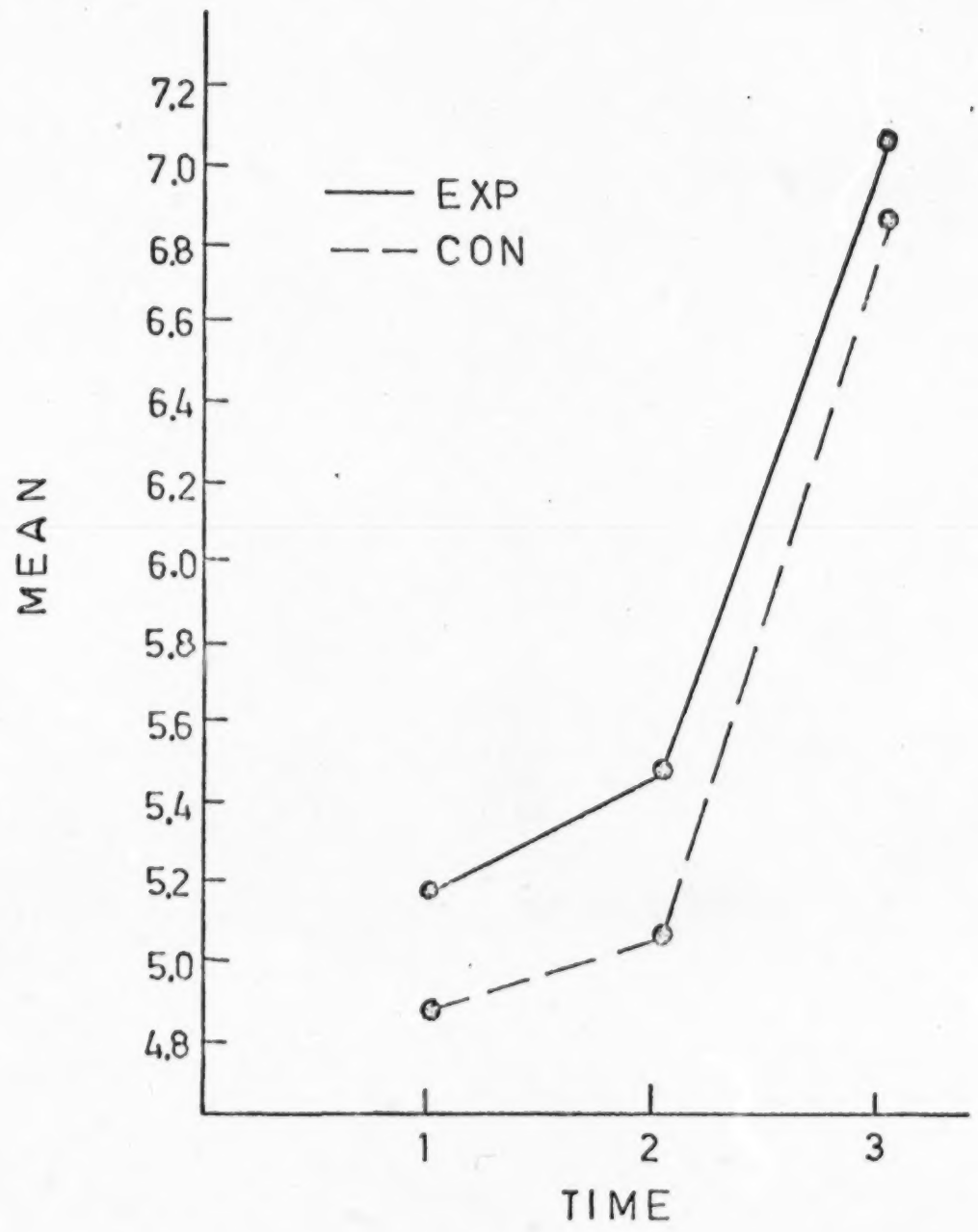


Fig. 5. Mean ratings obtained for Teacher Interest in Pupils. The asterisk indicates significant difference between groups ($p < .05$) using the Tukey (a) test.



Fit. 6. Mean ratings obtained for Teacher Interest in Student Achievement.